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This booklet, intended for children in grades K-3 as "vocational guidance in a space age," should be read to the child in early school years at an appropriate time. The booklet is divided into five chapters and a summary. Topics discussed concern space workers, space travelers, jobs in space, spaceships, and preparing for a career in space science. A bibliography of space books for children is included. (BC)

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ELEMENTARY (K-3) SCHOOL EDITION

Space Jobs

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SE 006 284

By Herman J. Peters, Samuel F. Angus, James J. Vessells of the Ohio State University

for the NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

ELEMENTARY (K-3) SCHOOL EDITION

SPACE JOBS

By

Herman J. Peters James J. Ves'sells Samuel F. Angus

THE OHIO STATE UNIVERSITY

in cooperation with

THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

through

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PREFACE

Grateful acknowledgement is made to all who permitted, encouraged, and participated in the several steps leading to "Space Jobs." Special gratitude is due Mr. Victor M. Showalter, The University School of The Ohio State University, and Mr. Lewis D. Evans, Franklin County Board of Education, for their excellent editorial work. To miss Ruth E. Jewett, our secretary, we offer a sincere "Thank you." To all in the Educational Programs Division, Office of Public Affairs, National Aeronautics and Space Administration, we extend our deep appreciation. In particular, we are grateful for the leadership of Dr. Paul L. Gardner, Counseling and Career Guidance Officer.

We hope this booklet will be helpful to children, teachers, and parents in the vocational guidance in their dynamic life dramas. Used with the assistance of a competently prepared elementary teacher or school counselor, it could well be a seed for nurturing a career choice leading to the development of a happy and productive lifework.

James J. Ves'sells

Samuel F. Angus

Herman J. Peters

FOREWORD

This booklet was written specially for boys and girls. We hope that adults will enjoy it, too. The mysteries of the sky, the stars, and the moon hold special interest for all children; so does work and play.

SPACE JOBS is a book to be read to the young child who is in the early school years. To learn about the world of work can be an exciting adventure for children. This book should be read to boys and girls by their brothers and sisters, their parents, or their teachers.

Hopefully, this booklet will combine the child's exciting space world of fantasy with the realistic new world of work in the space industry.

HOW TO USE THIS BOOK

This booklet is intended to be an idea producer for the young mind. It is vocational guidance for a space age. The booklet should be read to the child in the early school years and then given to him or her to handle, to look at or read, to possess. The questions about space that arise are those that may have lasting career implications.

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CHAPTER 1

SPACE WORKERS

PEOPLE IN SPACE JOBS

Men, and women, too, work in space jobs—some are doctors, some work with rockets, some of them even work with balloons and animals. They like their space jobs and have lots of fun in their work.

Men and women who work in space jobs are usually reading or writing or making things.

They ask each other all kinds of questions and talk a lot about their work. Many have little boys and girls at home, just like other people.

People who work in space jobs do many different things like working with electricity and chemicals and unusual kinds of machines. Some of them study about the stars; others make space suits.

Many of them go to school at night. In the future some of them may go to the moon to work. Would you like to go to the moon?

Some people who work at space jobs know a lot about the moon. They even have pictures of the moon to study. They will tell you about it if you ask them. No one knows *all* about the moon.

SPACE PILOTS

Would you like to be an astronaut? You would fly way out in space. Space is anyplace past the air we breathe. There is no air way out in space, so earth people must take air in their spacecraft or in space suits that have special helmets.

OUTER SPACE

You could be an astronaut. You would be inside the spacecraft—looking out through special telescopes.

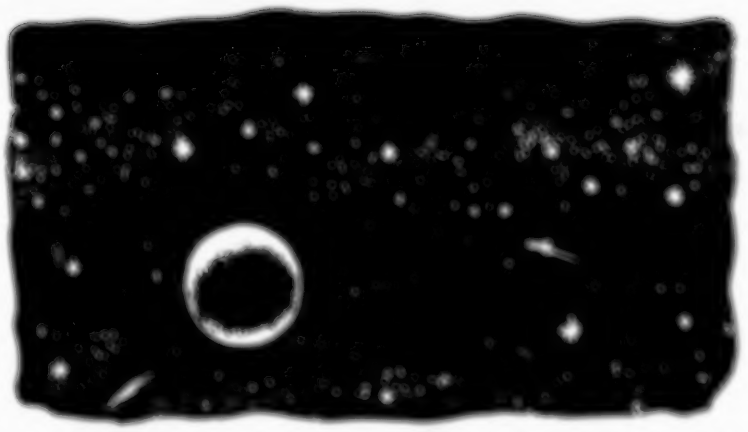
You would travel in a big spaceship through outer space. Outer space goes on and on for millions and millions of miles, so far that there is no end. Outer space is cold and there is no noise. Even the moon is thousands of miles away. The moon travels around the earth. It is more than 200,000 miles away. The earth is a planet. The earth is shaped something like an orange. It is in space, too. It spins around like a top while it travels around the sun. It spins around and around, but we cannot feel it spinning and we can't fall off because gravity holds us on.

When it is daytime where we are, the sun's rays fall on this side of the earth. As the earth spins around, it becomes dark on our side of the earth. There is no real day or night in outer space where space pilots go in their spacecraft.

PLANETS

There are eight other major planets that travel around the sun. They are also shaped very much like the earth. Some are bigger and some are smaller than the earth. The biggest of these is Jupiter. The smallest is Mercury. These are unusual names, but so are Atlas, Titan, and Saturn, which are the names of our rockets.

The sun and moon and stars and all of the nine planets, together with comets and other objects, are called a solar system. There may be many, many more solar systems that have not been discovered.



Maybe you can explore our own special solar system someday. But the first place you would want to travel would probably be to the moon because it is closest. The moon is very hot in its daytime and freezing cold during its night. Other planets have moons, too. For example, the planet Jupiter has twelve moons.

After visiting the moon you might stop at a space rest station for something to eat and to take on more spaceship fuel. Fuel is what makes the rocket go. Rockets are what make the spaceship go. Rockets blast off like a Fourth of July skyrocket. Wouldn't it be fun riding in a spaceship to explore some other planets?

After that, who knows where else you might go—on and on? You could, you know!

ASTRONAUTS

Astronauts are space pilots. They used to be children in school just like you. Many

machines have been made to test astronauts. Engineers and scientists help make the machines to do the tests.

Here is a group of astronauts in their space suits. They were the first seven in the United States—now there are many more.

CARPENTER COOPER GLENN GRISSOM SCHIRRA SHEPARD SLAYTON

CHAPTER 2

JOBS IN SPACE

SCIENTISTS

There are many jobs that people have to do so spaceships can fly. Scientists think up new ideas and make plans for new spaceships. They figure out new ways to make rockets work better. Scientists and technicians put parts together. They may work in a place called a laboratory or they may work in an office or at a large factory.

Other scientists work with mice and monkeys and even dogs, and sometimes send them up in spacecraft. Engineers and scientists build instruments to study the stars. They also make air and food for astronauts to use.

Scientists go to high school and college. They study arithmetic, science, geography, and history. They learn about gas, electricity, light, and heat. It is important that they learn about everything they can and that they always ask questions. Scientists read a lot and listen and think. They work hard but they have lots of fun and usually make quite a bit of money. Engineers do, too.

ENGINEERS

The scientist and the engineer help each other. An engineer is a builder who puts things together and makes them work. Engineers often are the bosses on big projects. They usually know where everything is and how to put things together. They know why things work or fail to work and how to change things around.

TECHNICIANS

Technicians help engineers and scientists build the spaceship. Technicians put parts together. They take them apart. They work with different machines.

Technicians work with many kinds of motors and machines and with instruments and tools. Other men and women, too, help the technicians keep things running.

Technicians also work with animals. In this kind of work, technicians often get to play with the animals.

Technicians go to school and get special training. Technicians learn to draw, read maps, and measure things by going to school. They learn how to fix almost anything.

ASTRONAUTS

Only certain people can be astronauts. You have to have special training and pass many tests. You have to know all about your spacecraft and how to pilot it. You have to learn how to work your space radio and your space camera.

You have to be very smart and strong and brave. Someday girls, too, may be astronauts.

There are also doctors, lawyers, teachers, nurses, electricians, reporters, photographers, telephone operators, and many other kinds of people working in the space program.

The space program costs billions of dollars. Space jobs are important and are done by people who are alert, intelligent, and well trained. Many people want these space jobs.

These are good jobs and only the best people can get them. You could probably get a space job when you get through school if you study hard and become one of the best. When you grow up you may want to work in a new space job—one that has not yet been developed.

The National Aeronautics and Space Administration (NASA) is a government agency

that runs the space program. It has places all over the country where people are working on space projects. NASA tries to get people in schools, factories, laboratories, and offices to work together on the space program. They share information and their discoveries with each other and with all Americans. NASA scientists, astronauts, and many technicians work for our government. They help to make our space dreams come true. They help to bring about a better life, and healthier and happier people.

CHAPTER 3

TRAVELERS IN SPACE

ANIMALS

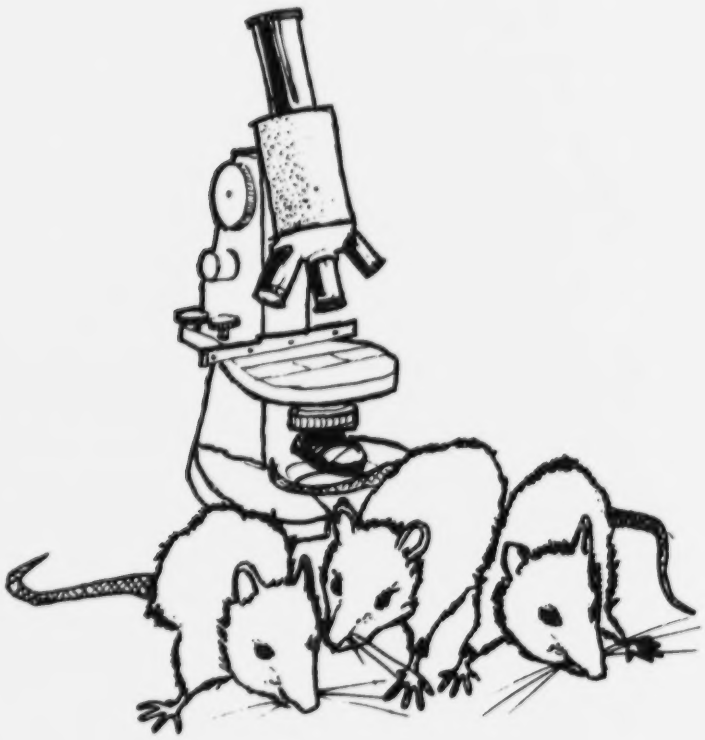
Many kinds of animals have flown in our spaceships. They are used in many of the experimental flights. Only after everything has been tested and found to be as safe as possible are people used in space experiments.

Scientists send up the animals to find out what will happen to people when they get in space. They send up rats and monkeys in spacecraft. They use cats and dogs and many other kinds of animals. The animals ride in the nose of the space vehicle just as the astronaut does. There are even special space suits for monkeys. A camera takes pictures of them while they are in space so that scientists can see what happens to them.

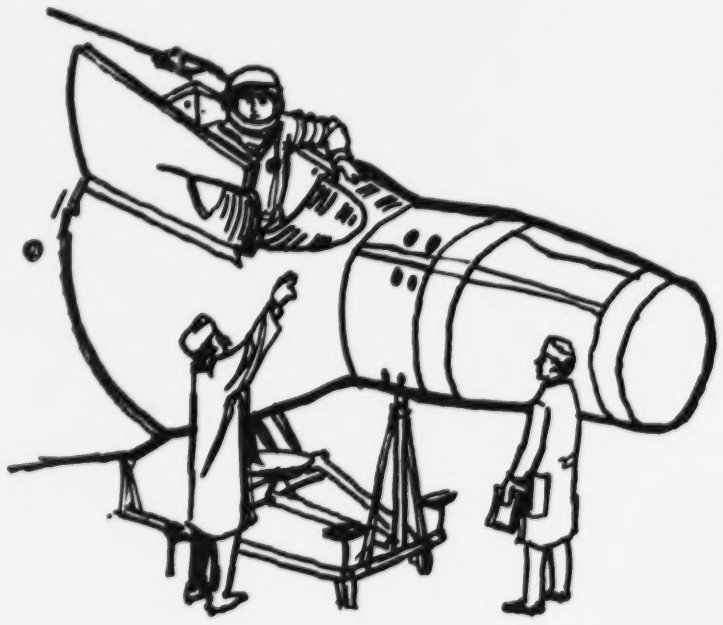
Scientists learn many things from these animals. Scientists, engineers, and technicians are always looking for new clues to solve the mysteries of space. Monkeys are used most often because they are like people in many ways.

Would you like to work with one of these cute little monkeys? Some technicians are trainers and do this kind of work all the time and get paid for it. They take very good care of these animals to keep them healthy and happy.

Here is a picture of little white rats. They are also used to study about men in space.



If you want to be a space pilot, a scientist, an engineer, or a technician, you need to study and work hard in school. You should read as much as you can about space. If you do, maybe some day you will help build a spaceship or be its pilot.

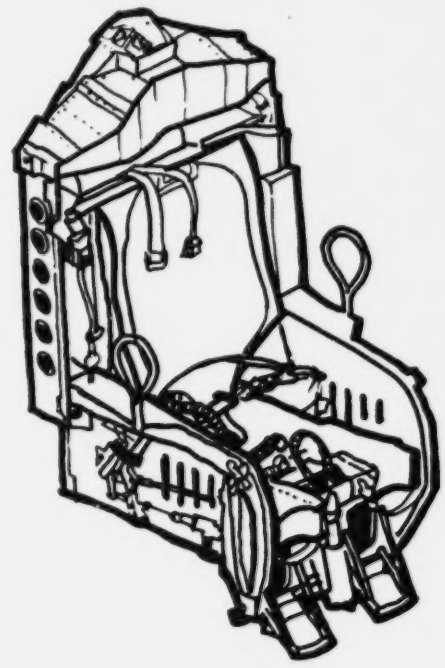


SPACE EXPLORERS

Many men who are your father's age have gone into space. These men had to pass special tests. For example, space travelers have to learn to live without gravity. Without gravity they have no weight. They float. Space travelers cannot sit or lie down unless they are strapped down. They may wear magnetic shoes or use special hand grips and belts in order to work. There is no top or bottom in space—just weightlessness.

Astronauts or other space travelers must also learn how to go around very fast and not get dizzy. There is a special machine that tests them. Not everyone can take these tests without getting dizzy.

The astronauts have special chairs made to fit their bodies. In fact, each astronaut's chair is made especially for him, once he has been selected to make a space flight.



Because of weightlessness, also limited space for storing food, scientists have created ways of putting food into small tubes and packages. When hungry, the astronaut can squeeze his food from a tube. Or he can add water to a package and squish the package until the water and food mix together. He then eats by squeezing the food out of the package.

CHAPTER 4

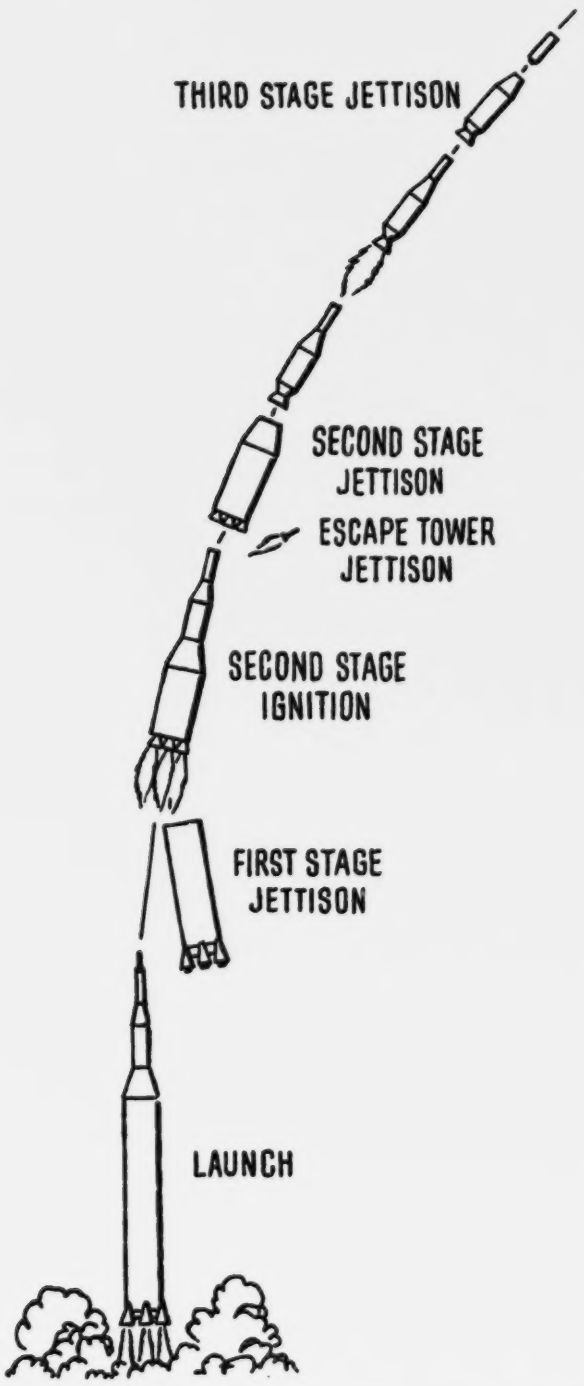
SPACESHIPS

5-4-3-2-1-Blast Off!

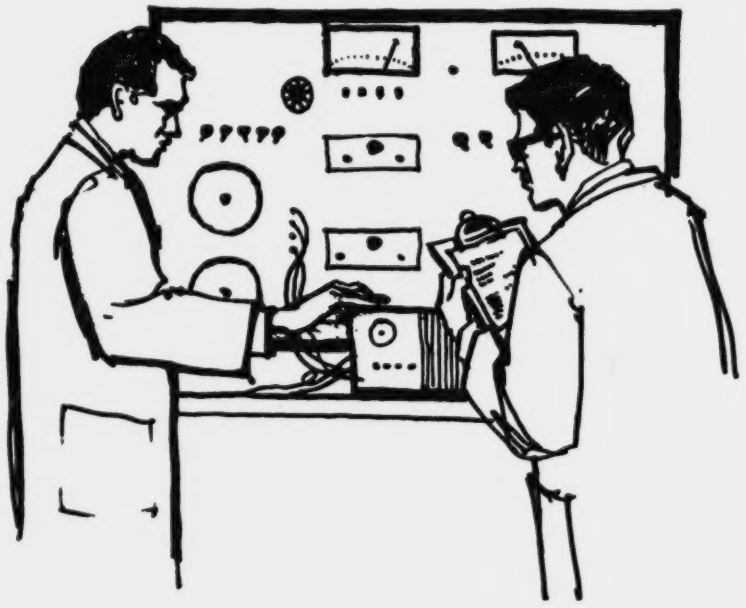
Up—Up—Climbs your spaceship! It has to have a special kind of fuel. This would be stored in the ship's fuel tanks. A special engine lights the fuel. Then the spacecraft lifts off its launch pad. After a while the engines stop and the spaceship flies on and on in orbit until some-

thing slows it down or stops it. A moving object stops only when air or something stops it.

Some spacecraft are in three parts, called stages. Some of these are as large as a tall building. As they go high in the sky, the bottom stage breaks off when its fuel is gone. Then another engine starts up, shooting the rest of the craft farther up. Then the second part breaks off and falls toward the earth. This happens until only the capsule with the astronauts is left. You may have seen television pictures showing capsules landing in the ocean.

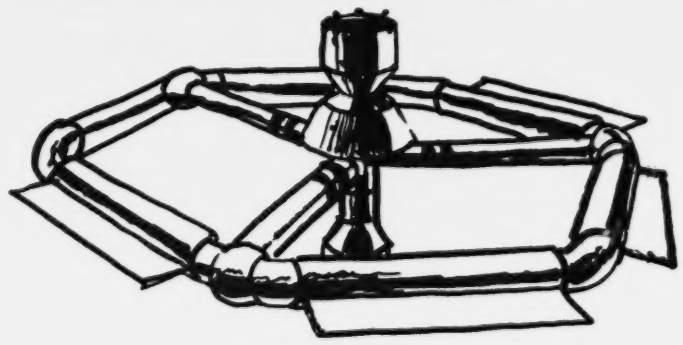


After the capsule is recovered, all the radios, cameras, and other instruments are inspected. Technicians and scientists use these instruments to get new information. Scientists and technicians study this new information to make other space shots work better.



SPACE STATIONS

You may someday visit a space station in orbit around our world. This could be a group of rooms in a large circle just like a shopping center in space. There would be a place to refuel and to get more food and supplies. There would be a place to rest and relax before you travel on. You could get your spaceship fixed there, also. This would be a stopping place for everyone traveling to some other planet.



Lots of men will be needed to build these kinds of space centers and to work in them. More and more people will be needed. Bigger and bigger space vehicles will be made. Boys and girls now in school, like you, will be making them and some will be flying in them.

CHAPTER 5

GETTING READY FOR A SPACE JOB

LEARN NOW

If you want to work on the space program when you grow up, you have to start getting ready now. As you get older you will learn more and more about space and what it offers. Then you might make plans to become a space pilot, scientist, engineer, technician, or perhaps a manager of space science projects.

You can get ready by reading many books and by listening when older people tell you about space and space jobs.

ASK QUESTIONS

You can talk about all kinds of space jobs with your teacher, your librarian, or someone who works at a space job. Ask questions like When? Where? Who? How? and Why?

GO TO MORE SCHOOLS

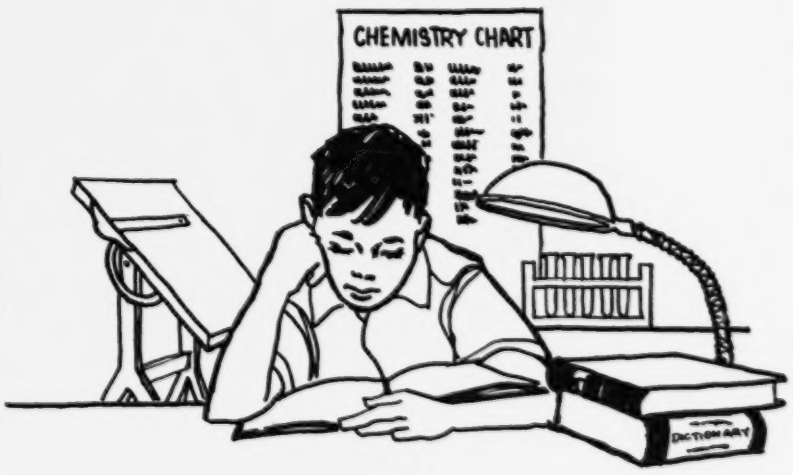
You must go to college to be a scientist, an engineer, a pilot, or a good technician. All the astronauts went to college. Sometimes technicians are trained at special schools that are not colleges. When you get old enough you might join the Air Force, Army, or some other branch of the service, and be a pilot, a mechanic, or a technician. People in the service work for our government just like those in NASA.

EXPERIMENT

You may want to learn about cameras, radios, alarm clocks, and model engines, now. Money that you earn and save could be spent to buy tools or equipment to make models. Maybe you will get a science set or some science books for your birthday. Can you invent something that can be used in space?

YOUR FUTURE?

The United States needs thousands of workers for the space program. New jobs are almost always open to the best workers. The Government needs good spaceships, excellent pilots, and the best educated men and women it can hire.



SUMMARY

Space is mysterious and exciting to think about. To explore space you need special machines and spaceships and specially trained people. Scientists, engineers, and technicians are building bigger and bigger spaceships for space travelers and explorers. These ships will carry people back and forth to the moon, other planets, and space stations.

It takes a lot of training for you to be an engineer, technician, scientist, or astronaut. You can start getting ready while you are a girl or boy. School is the place to start. You can also read about space, work on science projects, and visit places that have something to do with space. A good way for boys and girls to learn more is to ask questions. Most of all they must stay in school through college and study very hard.

It is fun to learn about space and even more fun to work in a space job. Space pilots, engineers, scientists, and technicians will be working in space. Will you?

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OTHER SPACE BOOKS FOR CHILDREN

EXPLORING SPACE by Rose Wyler. A Little Golden Book. New York: Golden Press, 1958.

I WANT TO BE A SPACE PILOT by Carla Greene. Chicago, Illinois: Children's Press, 1961

LOOK TO THE SKY, National Aviation Education Council, Inc. Washington, D.C.: National Aviation Council, Inc., 1953.

SPACE FLIGHT by Lester Del Rey. The Golden Book of Knowledge. New York: Golden Press, 1959.

WHAT IS A ROCKET? by T. W. Munch. Chicago, Illinois: Benefic Press, 1959.

WHAT IS SPACE? by Elmer R. Kane. Chicago, Illinois: Benefic Press, 1962.